REMARKS/ARGUMENTS

Reconsideration of this application and entry of this Amendment are solicited.

Claims 15-33 will remain active in the application subsequent to entry of this Amendment.

The Office Action Summary Sheet includes a typing error – the pending claims are 15-33 as correctly stated on page 2 of the Action and not 11-33 on the Office Action Summary.

It is proposed to amend the claims in order to more particularly point out and distinctly claim that which applicants regard as their invention by specifying, in each of the independent claims, that the glass is a non-crystallized glass. Basis for this appears in the original description of the invention as explained in the comments that follow, hence this Amendment does not include added subject matter.

The Official Action contains three new rejections based primarily upon Yamamoto et al U.S. 6,577,472 taken in combination with two subsidiary references to Zou et al and Zou, newly cited in the current Action. Both of the Zou references relate to crystallized glasses whereas the primary reference as well as the subject application relate to non-crystallized glasses. The significance of these differences is discussed in the remarks that follow.

Applicants address the issues raised in the outstanding Official Action in the order presented. In the outstanding Office Action, item 2, page 3, lines 5 to 10, the Examiner asserts that Yamamoto et al in Tables 1 and 3 teaches the glass specified in the present claims 15 and 21 to 24. Applicants disagree.

The glass specified in the present claims 15 and 21 to 24 contains, as essential components, all of SiO_2, B_2O_3, Al_2O_3 and Li_2O -- each in predetermined molar percent ranges. However, in Table 1 of Yamamoto et al, Glass Nos. 1 to 10 and 18 lack B_2O_3 and Li_2O, Glass Nos. 11 to 17 lack Li_2O, and Glass No. 19 lacks B_2O_3. In Table 3 of Yamamoto et al, further, Glasses Nos. 20 to 44 lack Li_2O.

Accordingly, it will be seen that Yamamoto et al do not disclose or suggest any of the glasses specified in the present claims 15 and 21 to 24. The rejection should be withdrawn.

In the Office Action, page 4, lines 2-5, the Examiner urges that "The *specific modulus* 30 x 10^6 Nm/kg newly added to the claims under consideration is taught by Zou et al US'490 (col. 3, lns 50,51) or Zou US'566 (col. 30, lns 29 to 31) in a crystallized alkali glass composition",

and in the Office Action, page 4, lines 6 to 12, further, the Examiner argues that it would have been obvious to adopt the *specific modulus* 30 x 10^6 Nm/kg shown in Zou et al or Zou in magnetic recording media of Yamamoto et al. Neither are reasonable assumptions.

Not only do the glass composition disclosed in Yamamoto et al and the glass composition disclosed in Zou et al or Zou differ from each other in that the former contains oxides of rare earth element and that the latter does not contain the same, but also the glass disclosed in Zou et al or Zou is a crystallized glass while the glass disclosed in Yamamoto et al is not a crystallized glass.

There is no reason, nor does this record establish, one skilled in this art would combine the non-crystallized glass of Yamamoto et al with the crystallized glasses of Zou et al and Zou – these two types of glasses are completely different from each other.

To emphasize these differences applicants have restricted the glasses in independent claims 1 and 21-24 to **non-crystallized** glasses.

The present specification supports the fact that the glasses specified in the present claims 15 and 21 to 24 are non-crystallized glasses, since the present specification in Examples 1 to 81, section [0072], clearly states: "In the thus-obtained glasses, no crystal that was observable through a microscope was precipitated", and since the present specification has, after this passage includes, no description of any heat treatment carried out to obtain crystallization.

In the Office Action, page 6, lines 14-18, the Examiner complains that the evidentiary declaration of Mikio Ikenishi only shows experimental results of two samples (Glass Examples 36 and 37) of Yamamoto et al and that "There is not the requisite evidence of properties necessary to establish the non-obviousness of instant broadly claimed invention." This is an incorrect conclusion.

Applicants submit the comparisons of record are fair, representative and based upon a rational selection. The reasons for carrying out duplicate experiments of only Glass Examples 36 and 37 of Yamamoto et al is as follow:

Yamamoto et al disclose Glass Nos. 1 to 19 in Table 1 and Glass Nos. 20 to 44 in Table 3.

According to Tables Ia to Ig attached to the Ikenishi declaration (additional copy attached hereto for the examiner's convenience), in Glass Nos. 1 to 19, the content of B_2O_3 is 0 mol%

and/or the total content of SiO_2, B_2O_3, Al_2O_3 and R_2O (R = Li, Na, K) is less than 90 mol%. As such, these glasses are far removed from the glasses specified in the present claims 15 and 21 to 24, so that these glasses have been omitted as non-relevant.

Further, since the present claims 15 and 21 to 24 have a limitation that the content of SiO_2 is 75 mol% or less, Glass compositions Nos. 22, 23, 32 and 33 having an SiO_2 content of over 75 mol% have been also excluded.

A specific modulus is Young's modulus/specific gravity, so that the remaining Glass composition Nos. 20, 21, 24 to 31 and 34 to 44 were reviewed for glasses that would have high Young's modulus and small specific gravity in the following manner:

Components constituting a glass and the Young's modulus and specific gravity of the glass have the following general laws.

- With an increase in the content of B_2O_3, the Young's modulus is decreased.
- Li_2O, MgO and CaO increase the Young's modulus. Further, since these are light-weight components, the specific gravity is decreased.
- With an increase in the content of Al_2O_3, the Young's modulus is increased.

Glass composition Nos. 20, 21, 26, 27, 34 and 35 can be ignored since they have a relatively large content of B_2O_3, as large as 12 % or more, and contain none of Li_2O, MgO and CaO and since the glasses are considered to have low Young's modulus and high specific gravity.

Glass composition Nos. 24, 25, 28 to 32 and 34 to 36 can be omitted since they contain none of Li_2O, MgO and CaO and since the glasses are considered to have high specific gravity.

Using the above careful, rational selection process, this leaves Glass composition Nos. 37 to 44. Of these, Glass composition No. 37 has the largest CaO content and also has the largest content of Al_2O_3 and is considered to have a high Young's modulus.

For the above reasons, applicants consider that Glass composition No. 37 is a glass having the largest specific modulus and therefore it was selected as a glass to be studied the duplicate experiment.

In addition, Glass composition No. 36 although omitted by the above criteria was selected again as a glass representing a composition having a relatively small content of B_2O_3 and containing none of Li_2O, MgO and CaO, and it was used in the duplicate experiment.

In the actual duplicate experimental results, the specific modulus of Glass composition No. 37 was larger than the value of Glass composition No. 36, and in applicants' view, therefore, the above consideration is correct.

As explained above, the Glass composition having the highest specific modulus among the various Glass compositions of Yamamoto et al is Glass composition No. 37, and according to the Ikenishi Declaration of record, Glass composition No. 37 (Glass II in Declaration) has a specific modulus of 29.50×10^6 N·m/kg. From this it follows that all of Glass compositions of Yamamoto et al fail to satisfy the specific modulus lower limit of 29.50×10^6 N·m/kg specified in the present claims 15 and 21 to 24.

In the paragraph bridging pages 6 and 7 of the outstanding Office Action, the Examiner suggests that the specific modulus of 29.50×10^6 N·m/kg could be rounded off to the claimed 30×10^6 N·m/kg and is not different from "30×10^6 N·m/kg or higher" specified in the present claims 15 and 21 to 24. Applicants disagree. The point here is that there is a difference since the glass composition in question is considered to be the most relevant one, yet it still falls outside applicants' stated minimum value. More weight should be put on the fact that even the higher (highest) specific modulus among those of Glass compositions of Yamamoto et al still does not fall within the value specified in the present claims 15 and 21 to 24.

For the above reasons it is respectfully submitted that the claims of this application define inventive subject matter. Reconsideration, entry of this Amendment and allowance are solicited.

Respectfully submitted,

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Table Ia

Glass Compositions, expressed by mol%, of Examples 1 to 7 in Yamamoto Reference

	1	2	3	4	5	6	7
Composition	mol%	mol%	mol%	mol%	mol%	mol%	mol%
SiO2	70.95	70.88	70.53	53.98	69.95	48.14	70.95
B2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al2O3	0.52	0.29	0.52	0.61	0.30	0.56	0.52
B2O3/Al2O3	0	0	0	0	0	0	0
Li2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na2O	13.28	12.49	13.29	10.10	11.71	9.06	13.28
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MgO	5.98	4.43	5.99	4.51	3.00	4.12	5.98
CaO	8.39	7.43	8.40	6.36	6.47	5.69	8.39
SrO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZrO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gd2O3	0.49	0.49	0.49	0.52	0.50	0.53	0.49
Er2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CoO	0.39	3.98	0.79	23.91	8.08	31.89	0.00
NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.39
FeO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SiO2+B2O3+ Al2O3+R2O+RO	99.12	95.53	98.73	75.57	91.42	67.58	99.12
SiO2+B2O3+ Al2O3+R2O	84.75	83.66	84.34	64.70	81.95	57.77	84.75

Table Ib

Glass Compositions, expressed by mol%, of Examples 8 to 14 in Yamamoto Reference

	8	9	10	11	12	13	14
Composition	mol%	mol%	mol%	mol%	mol%	mol%	mol%
SiO2	70.87	70.94	70.76	69.22	69.25	69.23	69.72
B2O3	0.00	0.00	0.00	4.36	3.52	5.27	4.43
Al2O3	0.29	0.52	0.29	0.60	0.60	0.60	0.60
B2O3/Al2O3	0	0	0	7.266667	5.866667	8.783333	7.383333
Li2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na2O	12.49	13.28	12.47	9.80	7.90	9.87	7.95
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MgO	4.43	5.98	4.43	7.54	7.59	6.07	6.12
CaO	7.43	8.39	7.42	7.58	6.55	7.63	6.59
SrO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZrO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gd2O3	0.49	0.49	0.49	0.50	0.51	0.51	0.00
Er2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.48
CoO	0.00	0.00	0.00	0.41	4.09	0.82	4.11
NiO	3.99	0.00	0.00	0.00	0.00	0.00	0.00
FeO	0.00	0.41	4.14	0.00	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SiO2+B2O3+ Al2O3+R2O+RO	95.52	99.10	95.37	99.09	95.41	98.68	95.40
SiO2+B2O3+ Al2O3+R2O	83.65	84.73	83.52	83.98	81.27	84.97	82.70

Table Ic

Glass Compositions, expressed by mol%, of Examples 15 to 21 in Yamamoto Reference

	15	16	17	18	19	20	21
Composition	mol%	mol%	mol%	mol%	mol%	mol%	mol%
SiO2	71.82	73.53	68.57	71.11	66.89	56.76	56.12
B2O3	2.82	2.89	3.43	0.00	0.00	12.11	12.21
Al2O3	0.64	0.66	0.59	0.29	4.69	9.59	9.67
B2O3/Al2O3	4.40625	4.378788	5.813559	0	0	1.262774	1.262668
Li2O	0.00	0.00	0.00	0.00	20.75	0.00	0.00
Na2O	6.33	5.40	9.63	12.53	2.72	16.44	16.89
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MgO	6.49	4.98	7.41	4.45	0.70	0.00	0.00
CaO	5.83	5.97	6.39	7.46	0.50	0.00	0.00
SrO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZrO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gd2O3	0.00	0.00	0.00	0.00	0.00	0.56	0.56
Er2O3	1.71	2.10	0.00	0.00	0.00	0.00	0.00
CoO	4.37	4.47	3.99	0.00	3.75	4.54	4.54
NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FeO	0.00	0.00	0.00	4.16	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SiO2+B2O3+ Al2O3+R2O+RO	93.93	93.43	96.01	95.84	96.25	94.90	94.90
SiO2+B2O3+ Al2O3+R2O	81.61	82.48	82.22	83.93	95.05	94.90	94.90

Table Id

Glass Compositions, expressed by mol%, of Examples 22 to 28 in Yamamoto Reference

	22	23	24	25	26	27	28
Composition	mol%	mol%	mol%	mol%	mol%	mol%	mol%
SiO2	83.02	84.70	65.72	67.31	64.30	64.18	70.35
B2O3	3.73	3.37	9.81	9.40	13.37	14.48	3.40
Al2O3	1.24	1.37	8.01	7.72	0.63	0.38	2.26
B2O3/Al2O3	3.008065	2.459854	1.224719	1.217617	21.22222	38.10526	1.504425
Li2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na2O	7.25	5.82	11.44	10.55	16.88	16.15	19.19
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SrO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZrO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gd2O3	0.52	0.52	0.55	0.55	0.53	0.53	0.53
CoO	4.23	4.23	4.47	4.46	4.29	4.28	4.27
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SiO2+B2O3+Al2O3+R2O+RO	95.25	95.25	94.98	94.99	95.18	95.18	95.20
SiO2+B2O3+Al2O3+R2O	95.25	95.25	94.98	94.99	95.18	95.18	95.20

Table Ie

Glass Compositions, expressed by mol%, of Examples 29 to 35 in Yamamoto Reference

	29	30	31	32	33	34	35
Composition	mol%	mol%	mol%	mol%	mol%	mol%	mol%
SiO2	70.15	64.87	65.40	79.95	80.09	66.21	66.24
B2O3	4.14	6.04	6.33	4.62	4.99	13.62	13.70
Al2O3	2.13	3.17	3.36	3.15	3.34	0.38	0.19
B2O3/Al2O3	1.943662	1.905363	1.883929	1.466667	1.494012	35.84211	72.10526
Li2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na2O	18.78	21.07	20.05	7.46	6.75	14.98	15.07
K2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SrO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZrO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gd2O3	0.53	0.54	0.54	0.53	0.53	0.53	0.53
CoO	4.27	4.32	4.32	4.29	4.30	4.28	4.27
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SiO2+B2O3+ Al2O3+R2O+RO	95.20	95.15	95.14	95.18	95.17	95.19	95.20
SiO2+B2O3+ Al2O3+R2O	95.20	95.15	95.14	95.18	95.17	95.19	95.20

Table If

Glass Compositions, expressed by mol%, of Examples 36 to 41 in Yamamoto Reference

	36	37	38	39	40	41
Composition	mol%	mol%	mol%	mol%	mol%	mol%
SiO2	65.48	69.96	70.30	71.12	71.45	71.79
B2O3	6.41	8.24	8.12	7.97	7.84	7.71
Al2O3	3.04	5.00	4.91	4.80	4.71	4.61
B2O3/Al2O3	2.108553	1.648	1.653768	1.660417	1.664544	1.672451
Li2O	0.00	0.00	0.00	0.00	0.00	0.00
Na2O	20.22	10.28	10.15	9.47	9.12	8.77
K2O	0.00	0.00	0.00	0.00	0.00	0.00
MgO	0.00	0.00	0.00	0.00	0.00	0.00
CaO	0.00	2.27	2.06	1.74	1.76	1.77
SrO	0.00	0.00	0.00	0.00	0.00	0.00
BaO	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	0.00	0.00	0.00	0.00	0.00	0.00
ZrO2	0.00	0.00	0.00	0.00	0.00	0.00
Gd2O3	0.54	0.00	0.18	0.54	0.73	0.92
CoO	4.31	4.25	4.29	4.36	4.39	4.42
Total	100.00	100.00	100.00	100.00	100.00	100.00
SiO2+B2O3+ Al2O3+R2O+RO	95.15	95.54	95.10	94.88	94.66	95.75
SiO2+B2O3+ Al2O3+R2O	95.15	93.48	93.36	93.12	92.89	93.48

Table Ig

Glass Compositions, expressed by mol%, of Examples 42 to 44 in Yamamoto Reference

	42	43	44
Composition	mol%	mol%	mol%
SiO2	73.04	73.17	73.54
B2O3	7.42	6.73	6.59
Al2O3	4.40	3.92	3.82
B2O3/Al2O3	1.686364	1.716837	1.725131
Li2O	0.00	0.00	0.00
Na2O	7.89	8.45	8.07
K2O	0.00	0.00	0.00
MgO	0.00	0.00	0.00
CaO	1.21	1.23	1.24
SrO	0.00	0.00	0.00
BaO	0.00	0.00	0.00
ZnO	0.00	0.00	0.00
TiO2	0.00	0.00	0.00
ZrO2	0.00	0.00	0.00
Gd2O3	1.50	1.90	2.11
CoO	4.54	4.60	4.64
Total	100.00	100.00	100.00
SiO2+B2O3+ Al2O3+R2O+RO	93.96	93.50	93.25
SiO2+B2O3+ Al2O3+R2O	92.75	92.27	92.01